



SPARK GAP

Vol. 39, Issue 5, May 2022 *MARC - Serving Central Indiana Communities*

MARC Members,

This Saturday, May 21 at 8 am is our monthly meeting at the JC REMC building 750 International Dr. Franklin. Please join us. Our guest speaker is [Brian Smith, W9IND](#), President and Field Day Chairman of Indy United Amateur Radio Club. He will talk to us about Competitive Hamming – why it appeals to me, why it could be fun for others, why a number of Central Indiana amateurs banded together to form Indy United when we lost the opportunity to operate competitively in FD 2019, and how we unexpectedly wound up winning the overall championship in 2020.

The ARRL insists that Field Day is not a contest (which is a debate in itself). The Indy United Amateur Radio Club members are gearing up for Field Day 2022, and as usual it'll be a competitive effort, as they've finished 1st and 2nd overall during the past 2 years. Part of that effort involves organizing a GOTA team consisting of newly licensed and “generally inactive” (ARRL definition) operators. They've got more than a dozen signed up, but he'd like to add a few more in case of attrition, last-minute scheduling conflicts, etc...

Also, if any of you are familiar with working the birds, they're forming a Satellite Team ... plus, their VHF station is usually looking for FT8 operators. So they do have handful of “job opportunities” on the team, although they have more than enough phone ops to cover their Field Day operating schedule. (They have 2 all-CW stations, so there's always a chance they could use an experienced CW op.).

If you want to participate in FD with a competitive team, here's your opportunity.

Our club Secretary will be emailing the revised By-Laws this week. If you are a paid member, and you don't receive the email, check your Junk mail, or Spam folder first. If you still don't receive it, contact Secretary@midstatehams.org and let Jim know. If you do not have an email address on file, Jim will be mailing it USPS to the address on file with the club. We intend to vote to approve the revised By-Laws at the **JUNE** meeting. If you cannot attend, email your vote to Jim at Secretary@midstatehams.org or send US mail to the club PO Box in advance of the June meeting.

Our AuxComm/EmComm group is planning a Field Exercise Saturday May 28 at 10 am. Here is what we are planning (Feel free to participate if desired):

Have Field Teams, and Home/Mobile Team(s). We can use the club VHF repeater as a control channel to try to ensure communication between the groups (providing we are all in range of the VHF repeater). The Field Teams will go to a park, open area, etc... and set up portable HF and VHF/UHF stations. The Home/Mobile Teams will try to make contact with the Field Teams on HF and/or VHF simplex and/or UHF simplex. They should also try to send and receive a WinLink email with Field Team member(s). The Field Teams will attempt to contact each other on HF (e.g. 6m, 10m, 40m), VHF simplex, and

UHF Simplex. They should send a WinLink email to Jack, W8ISH and Noel, W9NMM from the field, and attempt to receive WinLink email from Home/Mobile stations and/or other Field Stations. The Field Teams should attempt to make Hunter contacts with POTA Activators (can use the POTA Spots page) and or make any contacts calling CQ. We agreed it would be best to do this on a Saturday morning, attempting to be fully set up by 10 am. The event will be Saturday May 28th (We realize this is the day before the Indy 500 but the group agreed that was not an issue).

We will set up a Google Doc with shared access so you can sign up, state if you will be Field or Home/Mobile, and planned location, as well as what you plan to set up if Field.

Here is what we have so far (more Field Teams can sign up if desired, or you can participate with an existing Field Team):

Field Teams so far:

-Tim WC9G will set up HF at Camp Atterbury Fish and Wildlife Area K-4183 (Official POTA Park) so all contacts go toward an activation. I will have VHF and UHF in the car only. If someone wants to set up a mast and VHF/UHF antenna, that would be great. If you want to participate, you are welcome

-Ken KD9ALA will set up HF at Brown County State Park K-2251 (Official POTA park) with Marlys KD9BHM and have HTs of VHF/UHF.

If the Field Teams can make contact on HF, i.e. 6m, they should continue to try lower power to know the limit required to make that contact from those locations (with the antenna setups used). They should determine minimum required power for each band they can successfully make the contact.

See you Saturday, 73,

Tim

WC9G



MAY 2022 BIRTHDAYS

KC9PMW --- MARK BRADBURY

KC9GCH --- LINDA HARSHBARGER

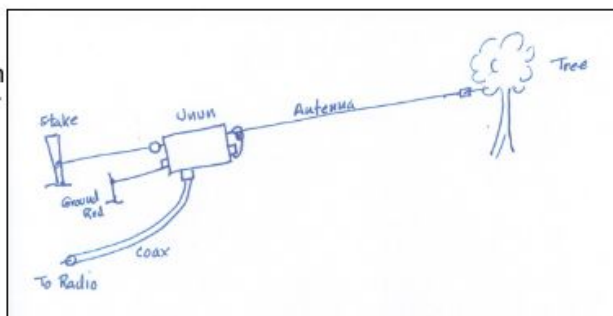
KA9QBF --- JOSEPH LOVRINIC

Don't Buy It, Build It!

W9HR's 9:1 Unun Build

A random length wire antenna is a very inexpensive and portable option for setting up your HF rig in the Field. By "random length", I don't mean "half wave" or any multiples of it. Some good lengths for random length antennas are: 29 35.5 41 58 71 84 107 119 148. There are longer lengths as well and there are listings of these on the Internet.

A typical random length antenna has an impedance of 450Ω . Since our amateur radio coax feed line expects around 50Ω , we have a mis-match that will not work. However, if we connect a 9:1 unun to one end of the antenna, it will provide the match and our 450Ω antenna will now look like 50Ω to the feed line.

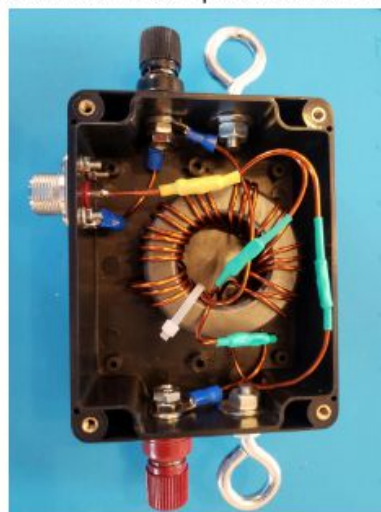


So what exactly is an unun? Well, its not the name of a North Korean dictator. Its actually short for "unbalanced to unbalanced." If you are familiar with baluns, they connect a balanced load (dipole for example) to an unbalanced network (coax feed line). Similarly, an unun connects an unbalanced load (end fed wire antenna) to an unbalanced network (coax feed line). Hence, the name "unun."

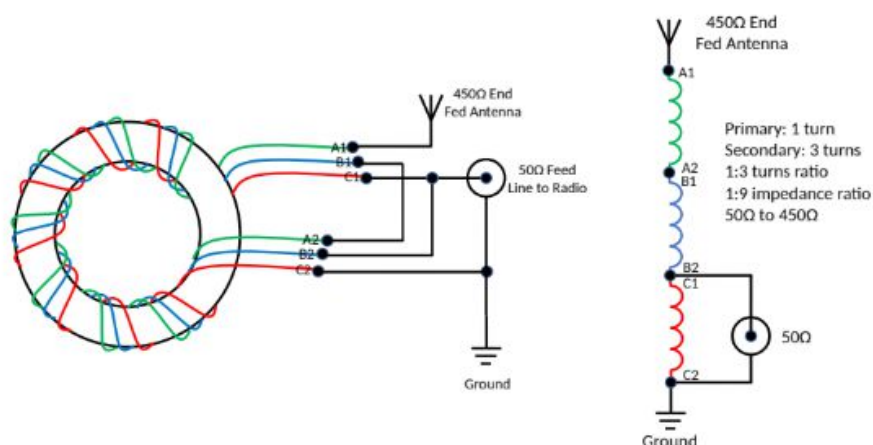


An unun is a simple autotransformer that can be constructed by winding wire around a donut shaped toroid. With the proper connections, we can produce a $450:50\Omega$ (9:1) autotransformer that will match the antenna's impedance to the feed line's.

The left side of the schematic diagram below shows the toroid winding. It consists of three wires wound around the toroid in parallel. The ends are then connected to the antenna network as shown. This can be very confusing at first sight. That's why I included the schematic on the right side of the diagram.



Unun 9:1 Autotransformer for Random Length End Fed Antenna



W9HR - D. Chapman
03/11/2022 Rev 1.0

If you look at the right-side diagram, imagine cutting a slice out of the toroid between where the wires emerge and straightening it out. The toroid winding now clearly shows a 3:1 (or 1:3) winding ratio. This yields the 9:1 transformer impedance ratio we are looking for. Confused? How does a 3:1 winding ratio translate to a 9:1 impedance ratio? Well, the impedance ratio is calculated by squaring the secondary winding. Therefore, $3^2 = 9$, so we have the 9:1 impedance ratio. You can look up the full mathematical derivation on the Internet if you are interested.

I built a 9:1 unun using readily available, inexpensive parts from my local home improvement store and Amazon. It consists of a toroid, a couple of eye bolts, two thumb screw terminals, an SO239 connector, a junction box, some 18AWG magnet wire, some ring and butt connectors and some shrink tubing. Add some rudimentary soldering skills and a dollop of patience. Strong fingers will also help.

Now, how do I know this will work? To test it, I soldered three 150Ω resistors together in series to produce a 450Ω load. This emulates the antenna's impedance. I connected this harness across the antenna and ground terminals on the unun. I then connected the unun to my antenna analyzer via the SO239. I then tested various bands and frequencies.



I was pleased with the results up to and including 15 meters. The following table shows the results of the testing.

Band	Frequency Mhz	SWR	Ω
160	1.9	1.1	50
80	3.8	1.1	50
40	7.2	1.1	49
20	14.25	1.2	49
17	18.13	1.5	49
15	21.3	1.7	51
12	24.95	2.1	60
10	29.0	2.9	85

There are plenty of good YouTube videos and other Internet sources that go into more detail than I have done here. If I piqued your interest, you may want to take a look and give it try. There is nothing like the satisfaction of building your own gear *and* knowing how it works.

If you have questions or comments, I can be reached at W9HR@outlook.com.

Have fun, Doug W9HR

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Amateur Radio Club Helps Teach Survival Skills

Members of the All Things Amateur Radio Association (ATARA-W8ATR), a family-oriented radio club in the foothills of southern Ohio, were in Lancaster on Saturday, April 30, to help support the After school Programs of Lancaster with their Family Survival Day at Alley Park.

Along with some radio related activities, ATARA provided instruction for the National Association for Search and Rescue's Hug-A-Tree program, explained what to do if you are lost in the woods, as well as taught families how a trash bag can keep you warm and dry. There were also primitive fire-starting demonstrations where families could learn how to use magnesium bars, char cloth, and jute.

The families visited a Parks on the Air® (POTA) station and listened as contacts were made across the country with stations in the Dominican Republic and Puerto Rico. Oscillating Keyers were also set up for the families to key their names in Morse code.

There were 80 participants and 30 volunteers. ATARA is an ARRL Affiliated Club.



ATARA member shows to use a trash bag for weather protection. [Photo, Jim Breibach, KE8SWY]

..... *ARRL NEWS MAY 2022*

An unusual Morse Code story from John Ruckert, WE4IAS, in Hollywood

California: "About 3 AM, I was awakened by someone sending S-O-S on their car horn. I leaped out of bed, grabbed a bathrobe, and with an extra-long metal-flashlight zoomed down a flight of stairs to our apartment buildings' carport. There I found a non-tenet young lady sitting just inside our rolling car-gate. I inquired, 'Are you the person sending S-O-S on a car horn?' She smiled, and said, 'Yes. I guessed if I just leaned on my car horn, to get someone to let me out with an electronic gate-opener, no one would respond. But you did in about 30-seconds!'"

..... *ARRL NEWS MAY 2022*

INDIANA HAMFESTS

June 11

Bloomington ARC Tailgate

Southside Christian Church

500 E Empire Mill Rd Bloomington, IN

www.bloomingtonradio.org

July 30, 2022

East Central Indiana Hamfest

8 am - 3 pm

Randolph County Fairgrounds

1885 S US 27 Winchester, IN

August 6, 2022

Elkhart East Hamfest

8am – 2 pm

21565 Executive Parkway Elkhart, IN <https://elkharteasthamfest.com/>

August 13, 2022

Hendricks Co. Tailgate

Avon United Methodist Church

6550 E US 36 Avon, IN

August 13, 2022

Auburn Hamfest

Auburn Cord Duesenberg Museum

9 am – 1 pm

1600 Wayne Street Auburn, IN

September 10, 2022

MARC Tailgate (Free)

8am to 12pm

1 Caisson Drive Franklin, IN <http://www.midstatehams.org>

October 8, 2022

Hoosier Hills Hamfest

8 am

Lawrence Co Fairgrounds

11265 US-50 Bedford, IN

www.w9qyq.org

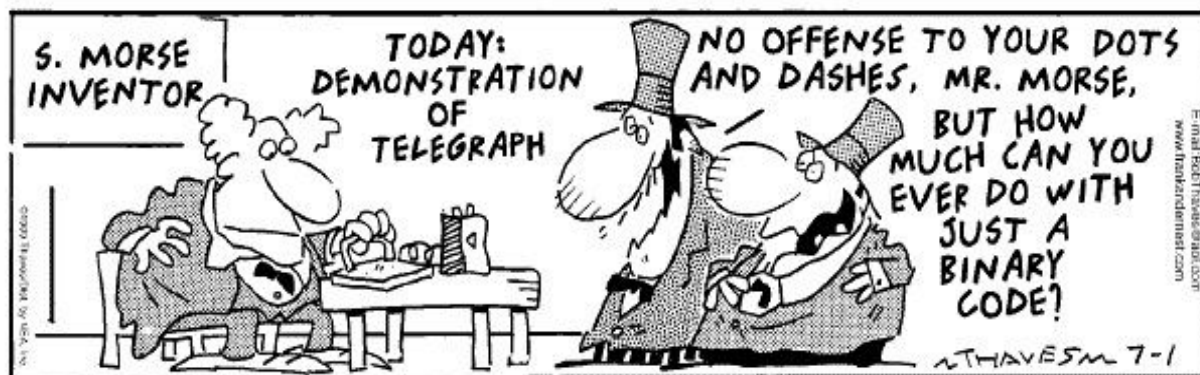
October 15, 2022

TARS - Octoberfest

7 am - 2 pm

Lynnville Community Center

416 W ST RD 68 Lynnville, IN



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MID-STATE AMATEUR RADIO CLUB

The Mid-State Amateur Radio Club meets the **THIRD SATURDAY** of each month at the Johnson County REMC building 750 International Dr. Franklin, IN 46131

See our website, www.midstatehams.org, for maps on how to get to our meeting.

Everyone is welcome; you do not have to be a *HAM* to attend our meetings or a member of the club.

W9MID Repeater:

146.835/
146.235 MHz
(151.4 Hz PL Tone)

Club Officers:

President: Tim Aldridge - WC9G
Vice President: Rhonda Curtis - WS9H
Secretary: Jim Adams – KB9JMU
Treasurer: Jacki Frederick - KI6QOG
Repeater Trustee - Chris Frederick – KQ9Y

W9MID Repeater:

443.525/
448.525 MHz
(151.4 Hz PL Tone) YEASU SYSTEM FUSION (C4FM)

Weekly Net: Sunday evening 7:00 PM ARES/RACES members and ALL RADIO AMATEURS
146.835/146.235 MHz (151.4 Hz PL Tone)

The Official Newsletter of the Mid-State Amateur Radio Club

P.O. Box 836
Franklin, Indiana
46131

Spark Gap Editor: Robert LaGrange N9SIU

Please send your articles to my email: n9siu@yahoo.com no later than the 2nd week of the month.



Thanks to Johnson Co. REMC for the use of their building for meetings and testing.